ATTACHMENT B

CONTINUOUS RELEASE

SUPPORTING DOCUMENTATION

Agrium's Response[1] to Questions Ecology and Environment, Inc. (September 27, 2002):

Plant 1/4 Emergency Flares

Comment:

According to your R&C report, when the emergency flare is activated and the Plant 4 ammonia drain tank is full, the vapors from this tank need to be vented to the atmosphere because they contain too much oxygen for the emergency flare to handle. Why is it that the emergency flare cannot handle gas streams that contain oxygen?

Reply

Flare systems are designed to burn combustibles. They are kept safe by excluding air (oxygen). If the flare piping has oxygen and fuel, it becomes an explosive mixture with the flare as the igniter. The flame propagates back into the vent piping with possible significant damage to the piping or connected vessels. Since our vents can contain hydrogen it is especially important that oxygen is kept out of the vent headers.

Plant 1 Wet Reformed Gas Vent, F-130

Comment:

Please provide calculations of the release rate. Also, for this particular release, does this happen for just one day or is it spread out over a number of days.

Reply

The primary reformer is a gas fired heater that must be heated at a reasonable rate to prevent stress damage due to rapid temperature changes. The shift converters also require heat up, to prevent water condensation that can damage the catalyst, and new catalyst requires careful reduction to prevent catalyst destruction. Wet gas venting continues until the reformers, shift converters and MDEA CO_2 removal systems are on line. Startups and shutdowns require venting. This venting costs natural gas feed with no production to sell. It is expensive but necessary. We minimize the time as much as possible and we avoid shutdowns and the resulting startups as much as possible for significant economic reasons. For economic reasons the vent rates are kept as low as possible consistent with startup requirements. A restart of a hot plant could have less than 6 hours on the wet gas vent. A cold plant would take 12 to 24 hours.

The release rate is calculated from the Simulation Sciences Computer Model (Pro II version 5.5). This model takes into account equations of state, temperature, pressure, flow rates, etc. The computer model algorithms are written in FORTRAN and are quite complicated. Current NH3 R&C emission estimates are 0, 0, and 6,200 pounds for average, minimum, and maximum quantities per day respectively.

Plant 2 Atmospheric Absorber, D-405 & Plant 2 Tank Vent Scrubber, D-406

Comment:

Do you have the calculations for the release rates from these two pieces of equipment?

Reply

The Plant 2 atmospheric absorber (D-405) takes vapors from the Plant 2 vent condenser hotwell tank (F-446). Based on the size and efficiency of the scrubber, normally the ammonia emissions at the exit of the scrubber are negligible (estimate zero pounds per day as lower bound and average emission rate). If the scrubber has to be taken out of service for maintenance, the vapors from the tank would be vented to atmosphere, for a maximum release rate of 1000 pounds per

[1] Comments authored by Suzanne Dolberg, START-2 Project Manager, Ecology & Environment Inc., Seattle, Washington. Replies authored by William Switzer, Senior Chemical Engineer, Agrium U.S. Inc., Kenai, Alaska.

day, based on engineering estimate (flow rate to tank, ammonia flash calculation, tank venting due to breathing and working losses).

The Plant 2 tank vent scrubber (D-406) removes ammonia vapors from the effluent accumulation tank (F434) and hydrolizer feed tank (F467). Based on the size and efficiency of the scrubber, normally the ammonia emissions at the exit of the scrubber are negligible (estimate zero pounds per day as lower bound and average emission rate). Note that currently the F434 is listed as a separate ammonia source – this vent was removed from the scrubber in 2001 because it was discovered that the pressure relief system on the tank was undersized. The vent to atmosphere from this tank will remain open until a new pressure relief valve can be installed during a plant shutdown that is scheduled for 2003. In the mean time, the reported maximum release rate from the D406 scrubber still assumes that vapors from the F434 and F467 are routed to the scrubber, and if the scrubber is taken out of service for maintenance, a maximum release rate of 1000 pounds per day occurs, based on engineering estimate (flow rate to tank, ammonia flash calculation, tank venting due to breathing and working losses).

Plant 2 Vent Scrubber, D-408

Comment:

In my notes I have written down that this scrubber removes ammonia from an inert gas stream, and that this inert gas stream is a waste stream. Where does this inert gas stream come from? What stage in the urea manufacturing process is this inert gas generated?

Reply

Air is added to the CO2 that is sent to the urea plants. This air passivates the stainless steel in the urea reactor and other vessels and piping in the high pressure system. Without the oxygen from the air, the stainless steel will lose its passive oxide layer and severe corrosion will result. The air does not condense with the ammonia in the condensers and is therefore considered "inerts". The inerts stream in Plant 2 was historically chilled to -10°F to remove most of the ammonia and vented. D-408 was installed to recover over 99% of the remaining ammonia. In Plant 5, D-511 performs a similar ammonia recovery.

Plant 3 Oil/Water Separator, F-1715

Comment:

What is the volume of oil in this tank? Is there analytical data or any other type of data that might support the periodic release rate of 1,500 pound per day?

Reply

Volume of the F-1715 is 10,000 gallons. Typically, this tank is approximately 50% full and consists of 10%-20% oil, and zero to 3% ammonia. The presence of the oil tends to prevent vaporization of the ammonia from the water. The oil is periodically removed and burned in Boiler 600A per conditions of the facility air permit.

The R&C maximum release rate of 1500 pounds per day was calculated as follows:
10,000 gallon tank capacity* 3% NH3 max * 5.2 lbs/NH3 per gallon = 1500 lbs/day. Typically olly water containing ammonia is only generated a few times per year (or less), and only when maintenance work such as a tank cleaning occurs.

Plant 4 Hydrogen Vent Stack, C-200

Comment:

Please provide calculations of the release rate. Also, for this particular release, does this happen or just one day or is it spread out over a number of days?

Reply

This is similar to Plant 1 except that the wet and dry gas vents are combined.

The calculation for the R&C release rate is determined in a similar manner as the F-130. Namely, using the Simulation Sciences Computer Model (Pro II version 5.5). Using these algorithms, the upper-bound estimate is 1,000 pounds per day. The lower bound is 0 pounds per day.

Plant 4 Ammonia Drain Tank, F-287

Comment:

Provide calculations on how the release rate was determined.

Reply

F-287 is normally nitrogen purged and vented to the KAV and flare. After the tank has been used to catch ammonia, the ammonia is boiled off to the flare. Residual water, oil and remaining ammonia is vacuum trucked to the oil water separator. Before connection to the vacuum truck, F-287 must be disconnected from the KAV header to prevent air in the flare system. Before reconnection to the KAV system, F-287 must be purged with nitrogen and vented and the vacuum breaker blocked in to prevent air in the KAV header.

Another situation in which the ammonia drain tank must be vented to the atmosphere is when the large flare (B501) is activated. The large flare pulls more of a vacuum than the small flare, causing the ammonia drain tank's vacuum breaker to lift, and allowing oxygen into the flare system. To avoid this, the drain tank is isolated from the flare system and vented to atmosphere whenever the large flare is in service. This occurs no more than 20 days per year.

The engineering estimate is as follows:
2000 gallon tank capacity x 8.34 lb/gal x 1% ammonia = 165 pounds ammonia.

Plant 4 Process Condensate Vent, F-263

Comment:

What is this source? How does it work (i.e. what is the vent used for?), and why is it considered a continuous source of ammonia emissions. I do have a P&ID for this particular piece of equipment, but I don't have calculations or analytical results that explain where the 120 pounds released per day came from. Please provide that information too.

Reply

F-263 accepts process condensate from the three water knockouts of both ammonia plants. The pressure of F-263 must be high enough to feed the G-251 process condensate stripper feed pumps and low enough for the water to flow from the water knockouts to F-263. PIC-314 makes up methane or vents as necessary to maintain the proper pressure. Entrained and dissolved inerts (mostly H2, N2 and CO2) in any of the feed streams eventually must be vented or the pressure would rise until some vessel could not be drained. The ammonia percent should be low.

The 120 pounds of R&C NH3 emissions per day is an engineering estimate.

Plant 4 Turnaround

Comment:

In your R&C report, there are a few releases that are associated with a Plant 4 turnaround. These releases are the Plant 2 and/or Plant 5 cooling tower releases and the Plant 4 Steam Knock-out Drum release. In looking at them closer, I've noticed that the duration of the plant 2/5 cooling tower release is 3 days whereas the duration of the plant 4 steam knock-out drum release is 30 days. Can you explain this discrepancy?

Reply

Process condensate stripper outages are minimized but are necessary for proper vessel maintenance and inspections. During a stripper shutdown for maintenance (which typically lasts

3 days) the process condensate is sent to the cooling towers to be evaporated. Normal cooling tower makeup is low grade water. Stripped process condensate is excellent quality water that is used for boiler feedwater and demineralizer makeup.

During Plant 4 maintenance turnarounds, which can last up to 30 days, the PC stripper usually remains in operation in order to process the condensate from Plant 1, but the overhead gas can no longer be taken to the reformer because it is shutdown for the turnaround. Thus, the overhead gas from the PC stripper is vented through the steam knock out drum.

Plant 5 Exchanger, E-535

Comment:

Do you have calculations or analytical data that supports the amount released per day from this particular piece of equipment?

Reply

This is a small stream of air that has leaked into the vacuum system that is at equilibrium with the water condensed out in E-535. Calculation of R&C NH3 emissions:

200 lb/hr (air/steam/co2/Nh3 based on 0.7 psi in upstream vessel) * 5% NH3 composition estimate = 10 lb/hr maximum = 240 lb/day maximum.

Plants 4 & 5 Vent/Flare Stack, B-502

Comment:

For the Plant 2 Small Flare, you sent me a spreadsheet that sums up the amount of ammonia burned daily. In order to determine how much is released from that source, I just multiply the number by 0.005. Do you have a similar spreadsheet for the Plant 5 small flare that you send me?

Reply

Plant 5 small flare spreadsheet attached to this document.

9/26/02
SCM/WRS/MLG

Plant 5 Flare Emission Information

Date	CO_2 Rate	C501 NH_3 Vol.%	T/D	CO_2 Vol.%	T/D	Inerts Vol.%	T/D	H_2O Vol.%	T/D	Vel.
1/3/02	17400	0.81	0.07	0.13	0.03	3.91	0.56	95.16	8.47	50
1/17/02	18.1	0.40	0.12	0.06	0.05	4.70	2.35	94.84	29.55	175
1/31/02	17.5	0.60	0.05	0.12	0.03	3.62	0.52	95.67	8.54	50
2/14/02	17.7	0.89	0.08	0.16	0.03	3.51	0.51	95.44	8.57	50
2/28/02	Plant # 4 down and Plant#5 at reduced rates.									
3/14/02	12000	1.57	0.54	0.37	0.33	0.39	0.23	97.67	35.60	200
3/28/02	18100	1.75	0.29	0.94	0.41	2.82	0.80	94.48	16.70	100
4/11/02	13500	0.09	0.01	0.01	0.01	5.49	1.56	94.41	16.64	100
4/25/02	16000	1.67	0.84	0.41	0.53	3.14	2.71	94.78	50.76	300
5/9/02	18000	0.20	0.03	0.01	0.00	2.58	0.74	97.21	17.42	100
5/23/02	17500	1.18	0.20	0.25	0.11	2.61	0.75	95.96	17.16	100
6/6/02	17900	1.50	0.25	0.36	0.16	3.37	0.96	94.76	16.84	100
6/20/02	16900	0.69	0.06	0.14	0.03	3.29	0.47	95.88	8.56	50
7/4/02		Plant not sampled due to holiday								
7/18/02	16400	2.71	0.45	0.92	0.39	5.57	1.56	90.79	15.86	100
8/1/02	16000	4.88	0.57	0.48	0.15	80.14	15.84	14.50	1.78	100
8/15/02	17600	1.68	0.21	0.31	0.10	5.49	1.17	92.53	12.26	75
8/29/02	16600	0.22	0.05	0.02	0.01	5.27	2.25	94.50	25.15	150
9/12/02	17000	1.82	0.08	0.45	0.05	4.50	0.32	93.24	4.14	25
9/26/02	17000	0.17	0.06	0.03	0.02	4.06	2.32	95.74	34.08	200

Plant 5 Flare Emission Information

Date	D511 NH_3 Vol.%	T/D	CO_2 Vol.%	T/D	Inerts Vol.%	T/D	H_2O Vol.%	T/D	Vel.
1/3/02	0.00	0.00	0.00	0.00	68.32	35.86	31.68	10.34	600
1/17/02	0.02	0.01	0.02	0.02	63.98	34.36	35.98	12.02	625
1/31/02	0.00	0.00	0.00	0.00	65.93	34.09	34.07	10.96	620
2/14/02	0.00	0.00	0.00	0.00	65.64	34.09	34.36	11.10	620
2/28/02									
3/14/02	0.01	0.00	0.01	0.01	45.19	25.07	54.79	18.90	420
3/28/02	0.00	0.00	0.00	0.00	60.77	37.90	39.23	15.22	635
4/11/02	0.00	0.00	0.00	0.00	47.87	27.52	52.13	18.64	460
4/25/02	0.00	0.00	0.00	0.00	60.19	33.43	39.81	13.75	560
5/9/02	0.00	0.00	0.00	0.00	60.36	37.60	39.64	15.36	630
5/23/02	0.00	0.00	0.00	0.00	40.21	37.52	59.79	34.71	630
6/6/02	0.00	0.00	0.00	0.00	40.59	37.59	59.41	34.21	630
6/20/02	0.00	0.00	0.00	0.00	65.41	33.57	34.59	11.04	560
7/4/02									
7/18/02	0.00	0.00	0.00	0.00	56.92	34.04	43.08	16.03	570
8/1/02	0.01	0.00	0.01	0.01	55.53	31.50	44.46	15.69	525
8/15/02	0.03	0.01	0.03	0.03	50.77	34.24	49.18	20.63	570
8/29/02	0.00	0.00	0.00	0.00	65.31	34.90	34.69	11.53	585
9/12/02	0.00	0.00	0.00	0.00	65.31	34.97	34.69	11.55	585
9/26/02	0.02	0.01	0.02	0.02	57.35	37.44	42.61	17.30	630

Plant 5 Flare Emission Information

Date	D512 NH_3 Vol.%	T/D	CO_2 Vol.%	T/D	Inerts Vol.%	T/D	H_2O Vol.%	T/D	Vel.
1/3/02	0.11	0.01	0.11	0.02	48.17	6.76	51.60	4.50	1250
1/17/02	0.09	0.00	0.09	0.01	60.33	3.49	39.49	1.42	550
1/31/02	0.26	0.03	0.26	0.07	48.68	8.63	50.81	5.60	1600
2/14/02	0.11	0.01	0.11	0.02	45.57	6.21	54.20	4.60	1200
2/28/02									
3/14/02	0.00	0.00	0.00	0.00	53.08	3.56	46.92	1.96	610
3/28/02	0.58	0.04	0.58	0.11	25.96	3.27	72.89	5.71	1000
4/11/02	0.00	0.00	0.00	0.00	83.16	1.98	16.84	0.25	250
4/25/02	0.00	0.00	0.00	0.00	58.65	9.50	41.35	4.17	1500
5/9/02	0.13	0.01	0.13	0.02	48.66	5.92	51.07	3.87	1100
5/23/02	0.19	0.01	0.19	0.03	57.60	5.58	42.03	2.53	900
6/6/02	0.33	0.02	0.33	0.06	45.61	5.70	53.72	4.18	1100
6/20/02	0.29	0.02	0.29	0.05	42.91	5.42	56.52	4.44	1100
7/4/02									
7/18/02	0.32	0.06	0.32	0.15	22.90	6.98	76.45	14.50	2400
8/1/02	0.11	0.01	0.11	0.03	49.80	9.70	49.97	6.05	1750
8/15/02	0.40	0.05	0.40	0.14	41.75	9.64	57.44	8.25	2000
8/29/02	0.00	0.00	0.00	0.00	53.69	9.42	46.31	5.05	1600
9/12/02	0.18	0.02	0.18	0.06	44.08	9.53	55.57	7.47	1900
9/26/02	0.26	0.02	0.26	0.04	44.23	5.03	55.25	3.90	1000

Plant 5 Flare Emission Information

Date	C502 NH_3 Vol.%	T/D	CO_2 Vol.%	T/D	Inerts Vol.%	T/D	H_2O Vol.%	T/D	Vel.
1/3/02	3.43	0.74	0.59	0.33	33.95	5.56	62.03	14.08	650
1/17/02	3.27	0.77	0.50	0.30	26.38	4.72	69.66	17.32	725
1/31/02	3.31	0.59	0.59	0.27	32.68	4.47	63.43	12.04	550
2/14/02	3.67	0.72	0.38	0.19	29.76	4.43	66.18	13.66	600
2/28/02									
3/14/02	0.46	0.11	0.04	0.02	52.59	9.47	46.92	11.71	680
3/28/02	10.29	1.74	1.29	0.56	33.11	4.28	55.31	9.91	520
4/11/02	3.44	0.59	0.56	0.25	20.72	2.70	75.27	13.62	550
4/25/02	6.19	1.00	1.51	0.63	34.54	4.28	57.77	9.91	500
5/9/02	5.08	0.66	0.89	0.30	31.11	3.08	62.92	8.64	400
5/23/02	8.56	1.49	1.51	0.68	26.55	3.54	63.38	11.70	550
6/6/02	9.03	1.45	1.82	0.75	31.28	3.82	57.87	9.80	500
6/20/02	4.99	0.66	1.38	0.47	36.08	3.62	57.54	8.01	400
7/4/02									
7/18/02	4.57	0.29	1.81	0.30	30.33	1.47	63.30	4.27	200
8/1/02	4.92	0.29	1.28	0.19	1.54	0.07	92.27	5.68	200
8/15/02	5.47	0.56	1.59	0.42	28.48	2.24	64.46	7.03	300
8/29/02	6.43	0.62	0.95	0.24	27.63	2.02	64.98	6.59	300
9/12/02	4.35	0.63	0.89	0.33	30.17	3.34	64.59	9.92	450
9/26/02	4.62	0.40	0.69	0.16	30.40	2.03	64.30	5.95	250

10-6-3

AMTEST ALASKA

AmTest Alaska
2000 W. Intl. Airport Road
Suite C-9
Anchorage, AK 99502
Office: 907-248-6600
800-770-9873
Fax: 907-248-3955

December 10, 1993

Ms. Denise L. Newbould
Unocal Chemicals & Minerals Division
Milepost 21.5 Spur Highway
Kenai, Alaska 99611-0575

Dear Denise:

Unocal Chemicals & Minerals Division contracted Am Test Alaska to quantify ammonia emission concentrations at the Prill Tower exhaust ducts at Unocal Petroleum Products and Chemicals Division's Urea Plant #2 in Kenai, Alaska. This testing was performed for informational purposes. A total of one (1) EPA Method 17/28 test was collected on October 13, 1993, at each of the eight (8) ducts at the Prill Tower. The impinger train included an additional impinger containing 0.1 Normal (N) hydrochloric acid (HCl) to absorb ammonia emissions.

The methodology which was used to collect the emission samples is discussed in the July 1, 1992 edition of the Environmental Protection Agency (EPA) document Title 40, Code of Federal Regulations, Parts 53-60 (40 CFR 60), Appendix A, Methods 1, 2, 3A, 4, 5 and 28. Methods 1 and 2 were performed to measure the stack gas temperature and velocity and for calculating the volumetric flow rate. Method 3A was performed to measure the oxygen (O_2) and carbon dioxide (CO_2) concentration in order to determine the molecular weight of the stack gas. Method 4 was performed to measure the moisture content of the stack gas. Method 17 (which is similar to Method 5 except that the filter is in-stack) was performed to collect the ammonia. The impingers were analyzed for ammonia, including the 0.1 N HCl solution included in the sample train.

Am Test utilized a Method 17 sampling apparatus whereby the gas passed through a stainless steel button hook nozzle, an in-stack filter, a stainless steel probe liner within a stainless steel probe sheath, and an impinger train for collecting ammonia. All glassware was thoroughly cleaned prior to use. The nozzle, probe liner, prefilter connective glassware and filter are often referred to as the "front-half" of the sample

train. Following the filter is a condenser section which, by convention, is referred to as the "back-half". The condenser section of the Method 17 sample train consisted of a modified Greenburg-Smith bubbler containing 100 milliliters (mL) of deionized water, an impinger also containing 100 mL of deionized water, an impinger containing 100 ml of 0.1 N HCl, an empty bubbler, and a bubbler containing indicating silica gel desiccant. The front-half of the sample train was recovered with deionized water. The water portion of the back-half of the sample train from the first two impingers was recovered into a graduated cylinder. The impingers were rinsed with deionized water and the rinses were combined with the contents of the graduated cylinder and the final volume was recorded. The third impinger with HCl was recovered in a similar manner along with the contents of the fourth impinger using deionized water to rinse the impingers. The back-half of the sample train was analyzed for ammonia by Am Test, Inc.'s Industrial Chemistry Division in Redmond, Washington. Reagent blanks containing deionized water and HCl were analyzed in an identical fashion.

Mr. James A. Guenthoer and Mr. E. Ray Lawrence of Am Test-Air Quality, Inc. performed the field sampling. Ms. Kristi L. Bischofberger performed the sample recovery and laboratory analysis of the particulate matter. Mr. Kris A. Hansen, Ms. Angela F. Blaisdell, Ms. Cassie B. Heaton, Ms. Jan W. Alden and Ms. Amy M. Brotherton performed data reduction and prepared the final report of results. Am Test, Inc.'s Industrial Chemistry Division in Redmond, Washington performed the ammonia analyses. Ms. Denise Newbould of Unocal coordinated this project.

The ammonia emission test results for the Method 17 tests performed at the eight (8) Prill Tower exhaust ducts are summarized in Table 1 below.

AMTEST
ALASKA

Table 1. Summary of ammonia emission test results from samples collected at the eight Prill Tower exhaust ducts on October 13, 1993 at Unocal Chemicals and Minerals Division, Urea Plant #2 in Kenai, Alaska.

Duct ID	Total Ammonia Emission Conc. (mg/dscm)	Total Ammonia Emission Conc. (ppm)	Total Ammonia Emission Rate (g/min)	Total Ammonia Emission Rate (lb/hr)
A	49.1	69.3	68.6	9.07
B	11.9	16.8	21.2	2.80
C	30.2	42.6	52.3	6.92
D	34.5	48.7	66.0	8.73
E	25.6	36.2	32.4	4.29
F	19.9	28.2	32.7	4.32
G	21.0	29.6	33.0	4.37
H	41.1	58.1	71.2	9.42
Average	29.2	41.2	47.2	6.24

6.24#/hr x 8ducts x 24hrs = 1198# day

The total ammonia emission concentrations in the table above are presented in units of milligrams of ammonia collected per dry standard cubic meter (mg/dscm) of gas sampled and in parts per million (ppm). The total ammonia emission rate is presented in units of grams per minute (g/min) and pounds per hour (lb/hr). An acceptable leak check of less than 0.02 cfm at the highest vacuum rate (or greater) used during the test preceded and followed each run. Results from each Method 17/28 run are included on the individual computer printouts for each run, which are included in this data package.

Please find enclosed three (3) copies of this data package which includes a summary table of ammonia emission test results, separate computer printouts for each run, laboratory analysis results, example calculations of results and field data sheets.

Please call Am Test-Air Quality, Inc. at (206) 222-7746 if you have any questions or require further information.

Sincerely,
Am Test Alaska

Kris A. Hansen
President

Enclosure

[c:\cbh\word\rpt\unoptltr]

Agrium

MLG
7/8/02

Plants 2 + 5 cooling towers

During PC Stripper outage → ~~Process Condensate~~ could be sent to cooling tower

Letter ENV-101-00 on 10/17/00 states that PC condensate is typically 6.1% NH_3

From R4Y-2400 D-212 Stream 6 (process condensate to PC stripper)

$$30.43 \text{ Lbmoles}_{NH_3}/\text{hr} \times \frac{17\#}{\#\text{mol}} \times \frac{24 \text{ hrs}}{\text{day}} \times 2 \text{ (assumes at least one plant is out of service)}$$

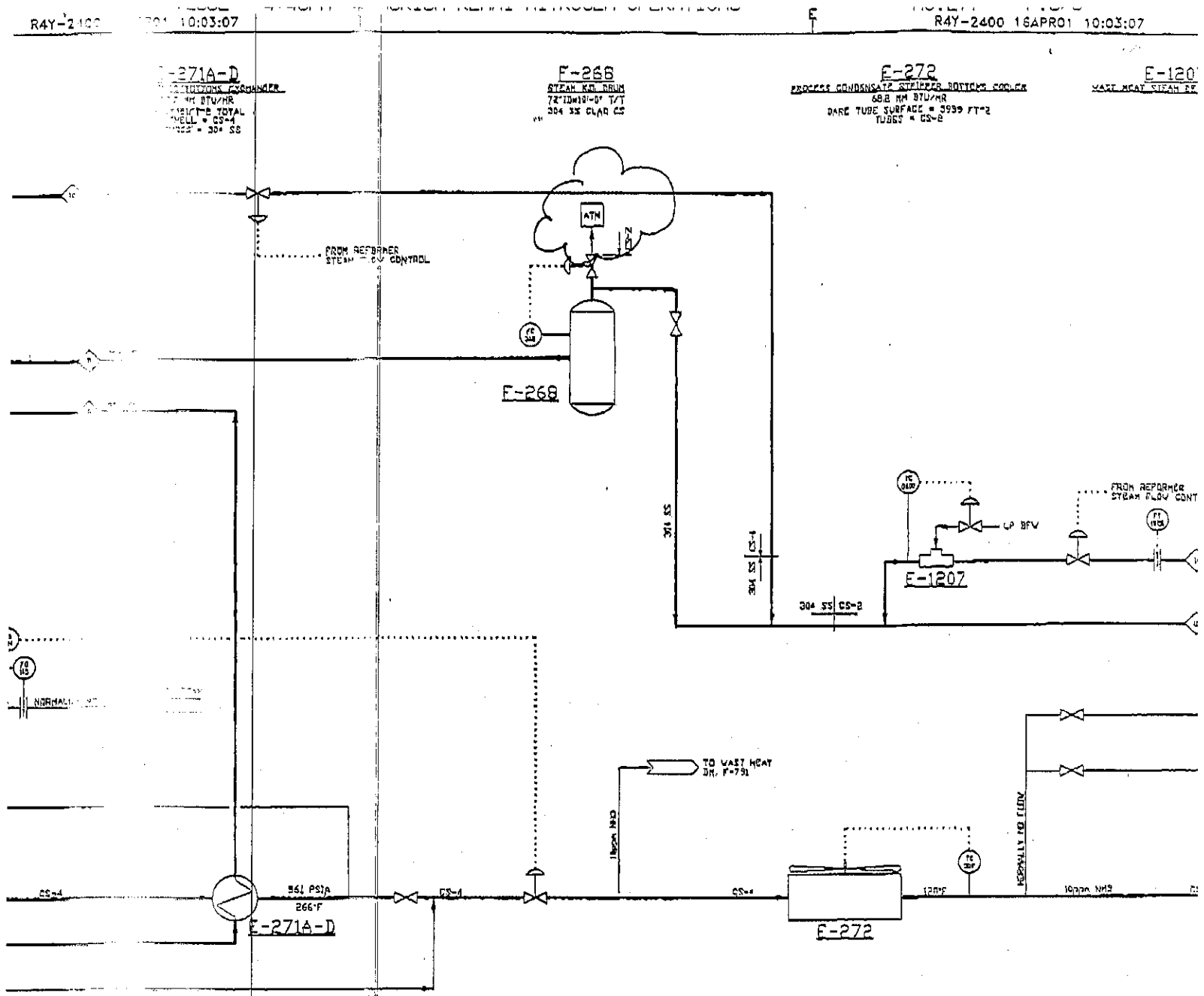
$$= 6,200\#$$

Plant 4 Process Condensate Stripper Steam Knock Out Drum (H-260) on top of E-260

If plant 4 reformer is out of service then plant 4 is down & steam condensate comes only from Plant 1

From R4Y-2400 Stream 1

$$15.3 \frac{\text{lbmol } NH_3}{\text{hr}} \times \frac{17\#}{\#\text{mol}} \times \frac{24 \text{ hrs}}{\text{day}} = 6200\#$$

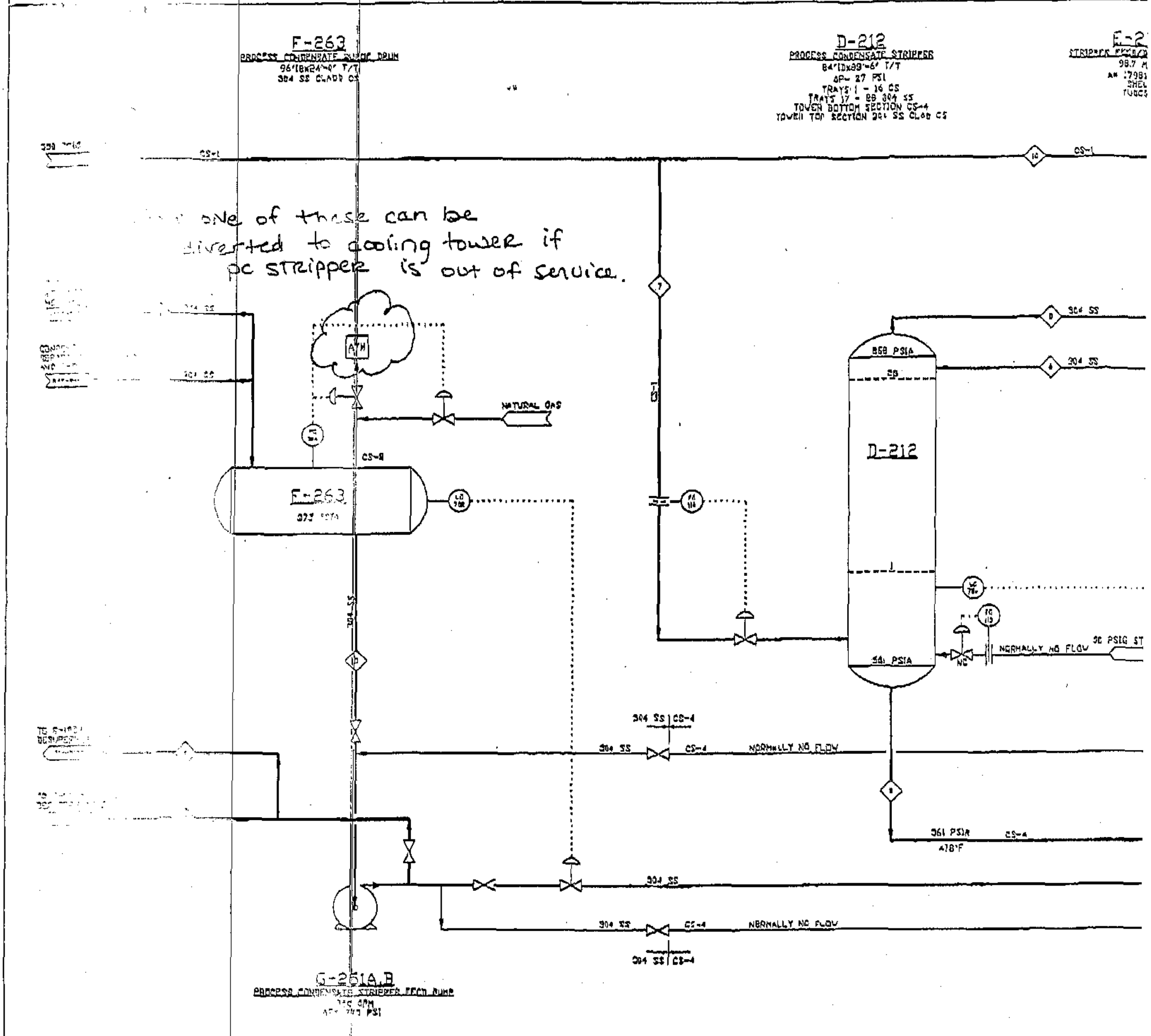


0.00			0.00	30.42	0.17
0.00			0.00	18.68	0.11
0.00			0.00	0.98	0.01
0.00			0.00	0.91	0.00
100.00		1599.13	100.00	18997.80	99.73
100.00		1599.13	100.00	19047.77	100.00
		134.850		343612	
		1700		338.0	
		948		286	
		18.815		18.039	
		0.065		0.693	
		0.0315		0.0287	
		0.0296		0.0296	

Process Flow Diagram

R4Y-2400

Condensate Stripper System.



NOTE

WINTER OPERATION BASIS 2000 STPD FRONT END

	STREAM NO.	1		2 PROCESS CONDENSATE FROM PLANT A		3 ... STRIPPER FEED PUMP DISCHARGE		4 PC TO PLANT 1 DESUPERHEATORS		5 PC TO PLANT 4 DESUPERHEATORS	
	COMPONENT	LBS-MOL/HR	MOL%	LBS-MOL/HR	MOL%	LBS-MOL/HR	MOL%	LBS-MOL/HR	MOL%	LBS-MOL/HR	MOL%
1	AMMONIA	[illegible]	[illegible]	10.10	[illegible]	33.54	0.11	1.44	0.12	1.50	0.13
2	CARBON ...	[illegible]	[illegible]	10.70	[illegible]	66.44	0.07	0.88	0.07	0.98	0.08
3	METHANOL	[illegible]	[illegible]	0.47	[illegible]	0.98	0.00	0.00	0.00	0.00	0.00
4	GAS	[illegible]	[illegible]	0.47	[illegible]	0.31	0.00	0.00	0.00	0.00	0.00
5	WATER ...	14623.93	99.9?	15287.74	99.9?	30561.68	99.81	1179.12	99.80	1174.00	99.79
6	...	[illegible]	100.00	15267.93	100.00	30117.30	100.00	1181.44	100.00	1176.01	100.00
7											
8	TOTAL ...	[illegible]		279155		548149		21305		21217	
9											
10	...	[illegible]		393.3		975.0		360.8		560.0	
11	...	[illegible]		290		933		239		239	
12	M.W.			18.034		18.024		18.030		18.034	
13	...			39.000		30.532		54.969		54.786	
14	...			0.8458		0.2394		N/A		N/A	
15	...			0.5954		0.2808		N/A		N/A	

	STREAM NO.	6 PROCESS CONDENSATE TO PC STRIPPER		7 STRIPPING STEAM TO PC STRIPPER		8 STRIPPER STEAM FROM PC STRIPPER		9 STRIPPED CONDENSATE TO ... COOLER		10 600 PSIG STEAM FROM ... STEAM HEADER	
	COMPONENT	LBS-MOL/HR	MOL%	LBS-MOL/HR	MOL%	LBS-MOL/HR	MOL%	LBS-MOL/HR	MOL%	LBS-MOL/HR	MOL%
1	AMMONIA	30.45	0.11	0.00	0.00	30.43	0.34	0.16	0.00	0.00	0.00
2	CARBON ...	18.05	0.07	0.00	0.00	18.66	0.22	0.00	0.00	0.00	0.00
3	METHANOL	0.98	0.00	0.00	0.00	1.98	0.02	0.00	0.00	0.00	0.00
4	GAS	0.31	0.00	0.00	0.00	0.90	0.02	0.00	0.00	0.00	0.00
5	WATER ...	27708.48	99.88	5730.17	100.00	8627.77	99.40	27030.08	100.00	5770.91	100.00
6	...	27739.45	100.00	5730.17	100.00	8679.75	100.00	27031.04	100.00	5770.91	100.00
7											
8	TOTAL ...	500688		103309		103700		501976		103963	
9											
10	...	350.0		370.0		530.8		361.0		375.0	
11	...	456		685		476		470		625	
12	M.W.	18.034		18.015		19.096		18.015		18.015	
13	...	49.842		5.962		1.164		49.982		0.969	
14	...	0.2156		0.0216		0.0182		0.1080		0.0216	
15	...	0.3549		0.0278		0.9817		0.9593		0.0270	

Agrium U.S. Inc.
Kenai Nitrogen Operations
PO Box 575
Kenai, Alaska USA 99611-0575
Telephone (907) 776-3150
Facsimile (907) 776-3213

Agrium

October 17, 2000

ENV-101-00
File 40-7.2.0

Mr. Thor Cutler
Region 10 Continuous Release – ERNS Coordinator
EPA (HW-114)
Sixth Avenue
Washington 98101

Dear Mr. Cutler:

Agrium Kenai Nitrogen Operations, formerly Alaska Nitrogen Products LLC, notified EPA of a "routine and continuous release" of ammonia on October 23, 1990 (Case Number 44607). In compliance with 40 CFR 302.8(g)(1), *Changes in Source or Composition*, this letter serves as notification of additional ammonia release sources. Telephone notification of the change was given on September 15, 2000. Per 40 CFR 302.8(g)(1), the following information is provided.

Description of Additional Release:

Beginning September 15, 2000, the Plant 2 and Plant 5 cooling towers (E-611 and E-711, respectively) are submitted as additional ammonia release sources. The process condensate stripper is taken out of service for maintenance approximately once every four years. The outage typically occurs during maintenance turnarounds and last for approximately 3 days. During outages, the process condensate, which contains approximately 0.1% ammonia, can be routed to either the Plant 2 or the Plant 5 cooling tower. A portion of the ammonia in the process condensate is evaporated in the cooling tower and released to the atmosphere.

Reason for Stating that it is Continuous and Stable:

Taking the process condensate stripper out of service for maintenance is a planned and

Need reasoning for Plant 4 H260 source – reformee changes (not plant 4 shutdowns) are necessary for maintenance. Plant 1 still has process condensate but if reformer is down, the D212 through D212 must be vented to atmosphere.

F-2168

Agrium

7/8/02

Plant 5 granulator Ammonia Emissions

6/7/99 granulator ppm NH_3 measured by Agrium lab (Marilu Moreno). Lab notebook pages attached

Found 57 ppm NH_3

To convert to pounds per day, use flow rates from Amtest stack analysis

Granulator stack A+B: measured 10/12/93
See file 10-12.3
Avg of 3 runs: 85,926.6 dscfm

Granulator stack C+D: measured 1/20/94
See file 10-12.3
Avg of 3 runs: 91,282.6 dscfm

Total = 177,209 dscfm
Average = 88,604 dscfm per stack

$$57\ ppm \times \frac{10^3 mg}{gr} \times \frac{1}{10^6 ppm} \times \frac{10^3 l}{1 m^3} \times \frac{273.15 K}{293.15 K} \times \frac{17.03\ g/gmol\ NH_3}{22.414\ l/gmol}$$

$$\times \frac{1\ m^3}{35.31\ ft^3} \times \frac{177209\ dscf}{min} \times \frac{60 min}{hr} \times \frac{24 hr}{day} \times \frac{lb}{453600 mg} \times \frac{ton}{2000 \#}$$

$$= 0.321 \frac{TONS}{DAY} \quad (642 \#/day)$$

Agrium

Granulator continued

Lower bounds assumes 60ppm @ both stacks @ 88,604 (Avg.)

$60\text{ppm} \times 88601.6 \times 3.1825\times10^{-8} \times 2600 \times 2 = 676\ \#/\text{day}$

Upper bounds assumes 100 ppm NH_3 max and 88604 dscfm = 1100 #/day

196

AVG = 38 + 64 + 43 → (48 ppm)

OT 400 C ① 45 → ~~Average 43 ppm~~
② 40

(1:55) Before the test 2:22 After the test

		Before the test	After the test
Opacities	A	37 - 40	30 - 40
	B	33 - 34	33 - 34
	C	32 - 33	32 - 32
	D	32 - 34	32 - 32

Avg. = 34 - 36 %

Ambient T = 63 °F at test time
Wind 1 mph from the south

6/7/99

Plant #5 . Granulator Stack Ammonia Emissions
(after permutation)
sampled at C 5600 A 2:40 - 3:10 pm

NOTE →

Back ① 60 ppm → ~~Ave. 60 ppm~~
② 60 ppm

Front ① 50 ppm $Avg = \frac{60+60+50}{3}$ ...

Plant Rate 16,550 scfm
no Wind - of sample time

AMTEST AIR QUALITY, INC.

SUMMARY OF RESULTS - METHODS 1, 2, 3A AND 4/28
AM TEST AIR QUALITY, INC.

NAME: L8603\UNUREASM
: UNOCAL CHEMICALS DIVISION
N: KENAI, ALASKA

	GRANULATOR C & D STACK			
	RUN #1	RUN #2	RUN #3	AVERAGE
	5029	5030	5031	
	1/20/94	1/20/94	1/20/94	
TIME:	10:04	11:27	12:54	
IME:	11:08	12:32	13:57	
LENGTH (minutes):	60.0	60.0	60.0	
SAMPLED (cubic feet):	31.695	32.790	32.598	32.361
SAMPLED (dry std. cubic feet):	32.778	33.307	32.816	32.967
SAMPLED (dry std. cubic meters):	0.928	0.943	0.929	0.933
S MOISTURE (percent):	5.47	5.62	5.70	5.60
IC PRESSURE (inches of Hg):	30.10	30.10	30.10	30.10
PRESSURE (inches of H2O):	-0.28	-0.28	-0.28	-0.28
PRESSURE (inches of Hg):	30.08	30.08	30.08	30.08
TEMPERATURE (degrees F.):	112.7	111.9	112.5	112.4
TEMPERATURE (degrees R.):	572.7	571.9	572.5	572.4
IOXIDE (percent):	0.1	0.1	0.1	0.1
(percent):	20.9	20.9	20.9	20.9
R WEIGHT (dry, g/g-mole):	28.85	28.85	28.85	28.85
WEIGHT (wet, g/g-mole):	28.26	28.24	28.23	28.24
ELOCITY HEAD (inches of H2O):	0.436	0.456	0.445	0.445
E Cp:	0.84	0.84	0.84	
S VELOCITY (feet/second):	38.9	39.8	39.3	39.3
IAMETER (inches):	90.0	90.0	90.0	
EA (square feet):	44.2	44.2	44.2	
AS AIRFLOW (dry std. cubic feet per min.):	90400.7	92326.7	91120.4	91282.6
AS AIRFLOW (actual cubic feet per min.):	103168.3	105404.5	104221.0	104264.6
IAMETER (inches):	0.222	0.222	0.222	
CS (percent):	99	99	99	
EMISSIONS				
SION CONCENTRATION (gr/dscf):	0.002	0.003	0.003	0.003
SSION RATE (lb/hr):	1.38	2.34	2.47	2.06

NOTE

AMTEST
ALASKA

SUMMARY OF RESULTS - METHODS 1, 2, 3A, 4 AND 5/28
AM TEST ALASKA

F NAME: S707\UNGRSUM -
YT: UNOCAL CHEMICALS DIVISION
TION: KENAI, ALASKA

	GRANULATOR A & B STACK			
	RUN #1	RUN #2	RUN #3	AVERAGE
LA[illegible]:	4689	4690	4703	
DA[illegible]:	10/12/93	10/12/93	10/12/93	
[illegible]RT TIME:	12:48	14:28	16:16	
[illegible] TIME:	13:55	15:39	17:23	
[illegible]E LENGTH (minutes):	60.0	60.0	60.0	
[illegible]VE SAMPLED (cubic feet):	37.380	39.121	38.992	38.498
[illegible]VE SAMPLED (dry std. cubic feet):	38.922	40.552	40.176	39.883
[illegible]E SAMPLED (dry std. cubic meters):	1.102	1.148	1.138	1.129
[illegible] GAS MOISTURE (percent):	6.40	6.35	6.31	6.35
BA[illegible]TRIC PRESSURE (inches of Hg):	29.95	30.00	29.95	29.97
STA[illegible]C PRESSURE (inches of H2O):	-0.29	-0.28	-0.29	-0.29
ST[illegible]K PRESSURE (inches of Hg):	29.93	29.98	29.93	29.95
[illegible]TACK TEMPERATURE (degrees F.):	113.5	118.3	118.7	116.8
[illegible]TACK TEMPERATURE (degrees R.):	573.5	578.3	578.7	576.8
[illegible]N DIOXIDE (percent):	0.1	0.1	0.1	0.1
[illegible]N (percent):	20.9	20.9	20.9	20.9
[illegible]AR WEIGHT (dry, g/g-mole):	28.85	28.85	28.85	28.85
[illegible]AR WEIGHT (wet, g/g-mole):	28.16	28.16	28.17	28.16
AV[illegible] VELOCITY HEAD (inches of H2O):	0.399	0.411	0.405	0.405
PI[illegible] TUBE Cp:	0.84	0.84	0.84	
ST[illegible] GAS VELOCITY (feet/second):	37.4	38.1	37.9	37.8
ST[illegible] DIAMETER (inches):	90.0	90.0	90.0	
[illegible] AREA (square feet):	44.2	44.2	44.2	
[illegible] GAS AIRFLOW (dry std. cubic feet per min.):	85453.9	86513.4	85812.4	85926.6
[illegible] GAS AIRFLOW (actual cubic feet per min.):	99130.7	100983.4	100353.2	100155.8
[illegible]E DIAMETER (inches):	0.253	0.253	0.253	
[illegible]ETICS (percent):	96	99	99	
[illegible] EMISSIONS				
[illegible] EMISSION CONCENTRATION (gr/dscf):	0.021	0.014	0.016	0.017
[illegible] EMISSION RATE (lb/hr):	15.3	10.7	11.8	12.4

NOTE

Agrium Plant 5 Vents

Plant 5 Data								
	C501		D511		D512		C502	
Date	NH_3 Vol.%	Tons/Day	NH_3 Vol.%	Tons/Day	NH_3 Vol.%	Tons/Day	NH_3 Vol.%	Tons/Day
1/4/01	0.01	0.00	0.11	0.04	0.08	0.00	30.26	2.10
1/18/01	0.00	0.00	0.04	0.01	0.10	0.00	24.42	2.33
2/1/01	0.57	0.05	0.01	0.00	0.00	0.00	26.44	1.64
3/1/01	0.08	0.03	0.07	0.02	0.14	0.02	5.06	0.75
3/15/01	0.92	0.31	0.02	0.01	0.00	0.00	3.55	0.72
3/22/01							7.46	1.00
3/29/01	1.33	0.68	0.00	0.00	0.02	0.00	21.64	4.81
3/29/01							24.87	2.42
3/29/01	0.78	0.07	0.01	0.00	0.00	0.00	4.99	0.59
4/26/01	1.10	0.37	0.11	0.04	0.05	0.01	18.29	2.55
5/10/01	1.30	0.16	0.13	0.05	0.10	0.01	5.53	0.57
5/24/01	2.02	0.59	0.10	0.03	0.15	0.01	5.88	0.67
6/7/01	6.98	1.02	0.06	0.02	0.12	0.01	9.35	1.11
6/21/01	0.41	0.03	3.19	0.70	0.00	0.00	4.45	0.49
7/5/01	1.77	0.15	0.00	0.00	0.06	0.00	5.54	0.47
7/19/01	1.14	0.10	0.03	0.01	0.06	0.01	8.25	0.94
8/2/01	7.02	1.79	0.03	0.01	0.09	0.01	5.90	0.47
8/2/01	7.02	1.79	0.03	0.01	0.09	0.01	5.90	0.47
8/16/01	6.08	1.43	0.01	0.00	0.00	0.00		
8/30/01	1.73	0.44	0.00	0.00	0.00	0.00	4.98	1.11
9/13/01	1.24	0.16	0.00	0.00	0.00	0.00	4.90	1.25
9/27/01	0.36	0.03	0.01	0.00	0.05	0.00	3.85	0.97
10/11/01	0.89	0.11	0.00	0.00	0.10	0.01	4.44	0.25
10/21/01	3.33	0.28	0.01	0.00	0.11	0.00	3.60	0.37
11/21/01	3.33	0.28	0.01	0.00	0.11	0.00	3.60	0.37
12/6/01	2.49	0.21	0.00	0.00	0.00	0.00	3.58	0.11
12/20/01	0.51	0.30	0.02	0.00	0.19	0.01	4.26	0.35
1/3/02	0.81	0.07	0.00	0.00	0.11	0.01	3.43	0.74
1/17/02	0.40	0.12	0.02	0.01	0.09	0.00	3.27	0.77
1/31/02	0.60	0.05	0.00	0.00	0.26	0.03	3.31	0.59
2/14/02	0.89	0.08	0.00	0.00	0.11	0.01	3.67	0.72
2/28/02								
3/14/02	1.57	0.54	0.01	0.00	0.00	0.00	0.46	0.11
3/28/02	1.75	0.29	0.00	0.00	0.58	0.04	10.29	1.74
4/11/02	0.09	0.01	0.00	0.00	0.00	0.00	3.44	0.59
4/25/02	1.67	0.84	0.00	0.00	0.00	0.00	6.19	1.00
5/9/02	0.20	0.03	0.00	0.00	0.13	0.01	5.08	0.66
5/23/02	1.18	0.20	0.00	0.00	0.19	0.01	8.56	1.49
6/6/02	1.50	0.25	0.00	0.00	0.33	0.02	9.03	1.45
6/20/02	0.69	0.06	0.00	0.00	0.29	0.02	4.99	0.66
Average (tons/day)		0.21		0.03		0.01		1.04
Average (lbs/d)		418		52		16		2073
Max (lbs/d)		1686		1410		85		5107

Agrium Plant 5 Vents

Cell: B2
Comment: Plants 4 and 5 Emergency Flare. This is the quantity leaking to the atmosphere (flare not ignited), unless noted.

Cell: D2
Comment: Plant 5 Vent Scrubber

Cell: F2
Comment: Plant 5 atmospheric absorber (D512 and D515). This is the amount released to the atmosphere.

Cell: H2
Comment: Plants 4 and 5 small flare. This is the quantity of ammonia that is burned in the flare. Assume 0.5% uncombusted.

Cell: I10
Comment: Breakthrough of ammonia until sulfatreat catalyst can be changed.

Cell: I11
Comment: Breakthrough of ammonia until sulfatreat catalyst can be changed

Cell: I12
Comment: Breakthrough of ammonia until sulfatreat catalyst can be changed.

Cell: C17
Comment: Flare was ignited, 99.5% of ammonia was combusted.

Cell: E18
Comment: Water treatment section was down at time of sampling for E-529 repairs.

Cell: C21
Comment: Flare was ignited, 99.5% of ammonia was combusted.

Cell: C22
Comment: Flare was ignited, 99.5% of ammonia was combusted.

Cell: C23
Comment: Flare was ignited, 99.5% of ammonia was combusted.

B-403 Large Flare Vent Stack Ammonia Emissions		
Sample Date	Laboratory Sample (tons/day)	Mo. On-stream Hours
1/11/01	0.00	
1/25/01	0.004	649.00
2/8/01	0.02	
2/22/01	0.02	672.00
3/8/01	0.08	
3/22/01	0.64	744.00
4/5/01	0.06	
4/19/01	0.11	720.00
5/3/01	0.05	
5/31/01	0.42	495.00
6/15/01	0.43	
6/28/01	0.14	671.00
7/12/01	0.43	
7/26/01	0.47	725.00
8/9/01	0.40	
8/23/01	0.71	
8/24/01	0.01	654.00
9/6/01	0.24	
9/20/01	0.65	
9/28/01	0.64	720.00
10/5/01	0.55	
10/18/01	0.47	689.00
11/1/01	0.32	
11/15/01	0.50	
11/29/01	0.06	720.00
12/13/01	0.02	
12/28/01	0.21	
12/31/01	0.32	744.00
1/10/02	0.32	
1/14/02	0.02	
1/24/02	0.25	744.00
2/7/02	0.12	603.00
3/7/02	0.14	
3/21/02	0.04	541.00
4/18/02	0.49	
4/19/02	0.07	271.50
5/2/02	0.00	
5/16/02	0.03	
5/30/02	0.01	723.47
6/13/02	0.01	
average (lbs/day)	381	
max (lbs/day)	1280	

Cell: C2
Comment: Vicki Scott:
Hours Onstream column is hidden for annual emissions report.

Cell: B4
Comment: Vicki Scott:
Large vent B403 is flaring at time of sample. Per DLN, hand calculate to determine accurate NH3 emissions. Lab sample .39 tons/day x 99% destruction efficiency = .0039 tons/day emissions.

Cell: B17
Comment: vscott:

Hand calculated average. Lab sampled during 2 hour event while bringing Plant 2 down per SCM.

3.55 T/D sample /24 hr x 2 hr duration + Average entry for 7/26 and 8/23 = .40 T/D estimate for 8/9/01.

Cell: B21
Comment: vscott:
per MLG: Calculate lab test of 3.53 tons/day for 2.25 days and .1 tons/day for 11.75 days = .65 tons/day actual average over 14 days between 9/6 & 9/20/01.

Cell: B22
Comment: vscott:
Starting 9/21/01 through 11/30/01, B402 small flare was re-routed to B403 large flare where rim fire was kept lit and all R&C emissions from both sources were burned.
Use 99% destruction efficiency factor for this time period only per MLG until repairs are done.

Cell: B23
Comment: vscott:
vscott:
Starting 9/21/01 through 11/30/01, B402 small flare was re-routed to B403 large flare where rim fire was kept lit and all R&C emissions from both sources were burned.
Use 99% destruction efficiency factor for this time period only per MLG until repairs are done.

Cell: B24
Comment: vscott:
vscott:
Starting 9/21/01 through 11/30/01, B402 small flare was re-routed to B403 large flare where rim fire was kept lit and all R&C emissions from both sources were burned.
Use 99% destruction efficiency factor for this time period only per MLG until repairs are done.

Cell: B25
Comment: vscott:
vscott:
Starting 9/21/01 through 11/30/01, B402 small flare was re-routed to B403 large flare where rim fire was kept lit and all R&C emissions from both sources were burned.
Use 99% destruction efficiency factor for this time period only per MLG until repairs are done.

Cell: B26

Comment: vscott:
vscott:
Starting 9/21/01 through 11/30/01, B402 small flare was re-routed to B403 large flare where rim fire was kept lit and all R&C emissions from both sources were burned.
Use 99% destruction efficiency factor for this time period only per MLG until repairs are done.

Cell: B27
Comment: vscott:
vscott:
Starting 9/21/01 through 11/30/01, B402 small flare was re-routed to B403 large flare where rim fire was kept lit and all R&C emissions from both sources were burned.
Use 99% destruction efficiency factor for this time period only per MLG until repairs are done.

Cell: B34
Comment: vscott:
Only one lab sample taken in Feb. due to plant shutdown per JAL.

Cell: B37
Comment: vscott:
Do not average over entire month. Weight at 1 day only during repairs to NH3 reclaim tank rupture pin valve. Lab resampled 4/19/02 @ .07 T/D.

Plant 2 Small Flare Ammonia

From	To	Totallzer Start	Totalizer End	NH3 Burned B-402 (lbs/mo)		R&C NH3 Burned B 402 (tons/mo) x OSE **
01/01/01	01/31/01	#REF!	594273.0	#REF!		#REF!
02/01/01	02/28/01	594273.0	618557.0	24284.0		12.14
03/01/01	03/31/01	618557.0	627380.7	8823.7		4.41
04/01/01	04/30/01	6794.7	11612.0	4817.3		2.41
05/01/01	05/31/01	11612.0	49116.6	37504.6		18.75
06/01/01	06/30/01	49116.6	94085.2	44968.6		22.48
07/01/01	07/31/01	94085.2	132942.0	38856.8		19.43
08/01/01	08/31/01	132942.0	248645.0	115703.0		57.85
09/01/01	09/21/01	248645.0	258739.0	10094.0		5.05
09/22/01	09/30/01	**B402 NH3 emissions re-routed to large flare and burned 9/21/01 - 11/29/01 @ 5 p.m.**				0.18
10/01/01	10/31/01	**Rim fire left burning on B403. Lab analysis was used to calculate NH3 burned while awaiting stack repairs.**				0.00
11/01/01	11/30/01					3.40
12/01/01	12/31/01	**Laboratory analysis was used to calculate the quantity ef ammonia burned 12/1/01 -**				1.14
01/01/02	01/31/02	306772.0	306834.0	62.0		0.03
02/01/02	02/28/02	306834.0	317944.0	11110.0		5.56
03/01/02	03/31/02	317944.0	319960.0	2016.0		1.01
04/01/02	04/30/02	319960.0	328345.0	8385.0		4.19
05/01/02	05/31/02	328345.0	339095.0	10750.0		5.38
06/01/02	06/30/02	339095.0	341215.0	2120.0		1.06

Average (lbs/day)	760.7
Max (lbs/day)	3856.8

Cell: D5
Comment: Vicki Scott:
Flow Totalizer was reset to zero March 15th. Change formula for accurate calculation of March routine & continuous lbs flared.
Totalizer end 3/15/00 at reset = 620586.0 + 3/31/01 analyzer total from zero 6794.7 = 627380.7 ending totalizer "total" for March

Cell: E5
Comment: Vicki Scott:
Plant 2 shut down entire month of March 2001.

Cell: C6
Comment: Vicki Scott:
Totalizer reset to zero 3/15/01.

Cell: D10
Comment: vscott:
Estimated due to missing analyzer reports 8/30 - 9/6/01 based on 8/29 and 9/7 flow totalizer readings. See file for details.

Cell: D11
Comment: vscott:
Emissions after 9/21/01 routed through the large flare and burned until repairs to the B402 stack are completed (Nov???). Use lab data 9/21 - ???? For R&C emissions @ 99% destruction ratio because burned.

Cell: D17
Comment: vscott:
Plant 1 upsets 2/19 - 2/23 and 2/25 - 2/27/02.

Cell: E23
Comment: This is the average quantity burned in the flare. To get the average released from the flare, multipy by 0.005 (99.5% efficient combustion of ammonia).

Cell: E24
Comment: Mazimum released in a day is used when there is a flare outage.

Plant 2 Vent Analysis Results - Ammonia

	D-407 Vent Scrubber	D-408 Inerts Vent Scrubber	
Date	Released Lb/Hr	Released Lb/Hr	
1/11/01	0.92	0.02	
1/25/01	0.09	0.04	
2/8/01	0.24	0.02	
2/22/01	0.48	0.00	
3/8/01	0.00	0.00	
4/5/01	0.00	0.00	
4/19/01	1.57	0.01	
5/3/01	0.28	0.26	
5/31/01	0.48	1.35	
6/14/01	2.16	0.01	Plant Shutdown
6/15/01	2.16	0.01	
6/28/01	0.09	0.02	
7/12/01	3.76	0.01	
7/26/01	4.68	0.01	
8/9/01	0.1	0.01	
8/23/01	1.77	1.13	
8/24/01	1.45	1.23	
9/6/01	1.27	1.52	
9/20/01	0.09	1.54	
9/20/01	0.78	n/a	
9/28/01	0.62	n/a	
10/5/01	0.75	1.52	
10/18/01	0.99	1.60	
11/1/01	0.76	1.59	
11/15/01	0.00	0.00	
11/29/01	1.22	1.42	
12/13/01	2.39	1.44	
12/28/01	2.67	1.25	
12/31/01	2.50	0.06	
1/10/02	2.60	1.48	
1/14/02	0.60	0.07	
1/24/02	0.47	0.09	
2/7/02	1.82	1.25	
3/7/02	2.19	1.90	
3/21/02	1.62	1.04	
4/18/02	0.46	0.00	
5/2/02	0.51	0.28	
5/16/02	0.86	1.42	
5/30/02	1.49	0.55	
6/13/02	0.64	0.25	
6/27/02	0.92	0.06	
Average	28.36	15.05	
Max	112.32	45.60	

Cell: B9
Comment: Vicki Scott:
Plant 2 shut down 2/23/01 thru 4/5 ??/01

Cell: C23
Comment: vscott:
Indication that scrubber was not being used. MLG advised and requested retest in p.m.

Cell: B29
Comment: vscott:
Plant 2 down. Plant 1 operating.

Plant 2 Vent Analysis Results - Ammonia

	D-407 Vent Scrubber		D-408 Inerts Vent Scrubber		F-1408 Vent K.O. Drum
Date	Released Lb/Hr	Absorbed Lb/Hr	Released Lb/Hr	Absorbed Lb/Hr	Absorbed Lb/Hr
12/13/2001	2.39	259.00	1.44	203.00	1.70
12/28/2001	2.67	375.00	1.25	192.00	0.00
12/31/2001	2.50	446.00	0.06	176.00	0.00
1/10/2002	2.60	315.00	1.48	218.00	0.00
1/14/2002	0.60	442.00	0.07	198.00	0.10
1/24/2002	0.47	410.00	0.09	138.00	0.10
2/7/2002	1.82	190.00	1.25	177.00	0.00
3/7/2002	2.19	209.00	1.90	276.00	0.00
3/21/2002	1.62	357.00	1.04	139.00	1.70
4/18/2002	0.46	0.00	0.00	55.00	0.00
5/2/2002	0.51	398.00	0.28	37.00	1.50
5/16/2002	0.86	327.00	1.42	403.00	0.80
5/30/2002	1.49	410.00	0.55	195.00	1.40
6/13/2002	0.64	444.00	0.25	81.00	1.20